

PATENT
Attorney Docket No.: 34003.55/P034
Customer No.: 000027683

II. AMENDMENTS TO THE CLAIMS

The text of all claims under examination is submitted, and the status of each is identified. This listing of claims replaces all prior versions and listings of claims in the application.

1 - 23 (Cancelled)

24. (Original) A method for manipulating a nanoscale object comprising:
depositing a plurality of reactive nanoscale objects onto one or more portions of a passive surface of a substrate wherein each of the plurality of nanoscale objects has one or more reactive sites covered with a cap;
providing a scanning probe microscope having a tip operable to act upon the passive surface and the cap;
forming a reactive site target position on at least one of the plurality of reactive nanoscale objects by causing the scanning probe microscope tip to remove the cap;
forming a bond between the scanning probe microscope tip and another of the plurality of reactive nanoscale objects;
moving the scanning probe microscope tip with the another reactive nanoscale object bonded thereto to the reactive site target position;
forming a bond between the reactive site target position and the another reactive nanoscale object bonded to the scanning probe microscope tip; and
breaking the bond between the scanning probe microscope tip and the another reactive nanoscale object.

25. (Original) The method of claim 24 further comprising, prior to the forming of the bond between the scanning probe microscope tip and another of the plurality of reactive nanoscale objects:
forming one or more surface target positions on the passive surface by causing the tip of the scanning probe microscope to act upon one or more portions of the passive surface where a reactive nanoscale object was not deposited;

PATENT
Attorney Docket No.: 34003.55/P034
Customer No.: 000027683

forming a bond between at least one of the plurality of reactive nanoscale objects and the scanning probe microscope tip;

moving the scanning probe microscope tip with the at least one reactive nanoscale object bonded thereto to one of the surface target positions;

forming a bond between the reactive nanoscale object and the surface target position; and
breaking the bond between the scanning probe microscope tip and the reactive nanoscale object.

26. (Currently Amended) The method of ~~claim 24~~ claim 25 wherein the forming a reactive site target position on at least one of the plurality of reactive nanoscale objects comprises causing the scanning probe microscope tip to remove the cap on the reactive nanoscale object bonded at the surface target position.

27. (Original) A method for manipulating a nanoscale object comprising:
depositing a plurality of nanoscale objects onto one or more portions of a passive surface of a substrate wherein at least one of the nanoscale objects comprises a reactive site covered with a cap;

providing a scanning probe microscope having a tip operable to act upon the passive surface and the cap;

forming one or more surface target positions on the passive surface by causing the tip of the scanning probe microscope to act upon one or more portions of the passive surface where a nanoscale object is not deposited;

forming a bond between the scanning probe microscope tip and at least one selected object from the plurality of nanoscale objects;

moving the scanning probe microscope tip with the at least one selected object bonded thereto to one of the surface target positions;

forming a bond between the at least one selected object and the surface target position;
and

breaking the bond between the scanning probe microscope tip and the at least one selected object to leave the at least one selected object bonded at the surface target position.

PATENT
Attorney Docket No.: 34003.55/P034
Customer No.: 000027683

28. (Original) The method of claim 27 wherein the at least one selected object comprises a nanoscale object comprising a reactive site covered with a cap, and comprising:

- forming a reactive site target position on the nanoscale object bonded at the surface target position by causing the scanning probe microscope tip to remove the cap;
- forming a bond between the scanning probe microscope tip and a second selected object from the plurality of nanoscale objects;
- moving the scanning probe microscope tip with the second selected object bonded thereto to the reactive site target position;
- forming a bond between the second object and the reactive site target position; and
- breaking the bond between the scanning probe microscope tip and the second object.

29 - 48 (Cancelled)

49. (New) The method of claim 24 wherein the moving of the scanning probe microscope tip with the at least one reactive nanoscale object bonded thereto to one of the surface target positions comprises:

- moving the scanning probe microscope tip in an upward direction relative to the plane in which the passive surface lies;
- moving the scanning probe microscope tip in a direction parallel to the plane in which the passive surface lies and toward the surface target position; and
- moving the scanning probe microscope tip in a downward direction relative to the plane in which the surface target position lies.

50. (New) The method of claim 24 wherein the passive surface comprises a surface selected from a hydrogen-terminated semiconductor surface, an inherently passive surface and a natively passive surface.

51. (New) The method of claim 24 wherein the passive surface comprises a surface selected from a hydrogen-terminated silicon surface, a graphite surface and a mica surface.

PATENT
Attorney Docket No.: 34003.55/P034
Customer No.: 000027683

52. (New) The method of claim 24 wherein the passive surface comprises an inherently passive surface and the acting of the scanning probe microscope tip on the passive surface to form one or more surface target positions comprises at least one of breaking bonds within the surface and locally oxidizing the surface.
53. (New) The method of claim 24 wherein the passive surface comprises a hydrogen-terminated semiconductor surface, and the acting of the scanning probe microscope tip on the passive surface comprises removing at least one hydrogen atom from the passive surface.
54. (New) The method of claim 24 wherein the scanning probe microscope is selected from the group consisting of: scanning tunneling microscopes (STM); atomic force microscopes (AFM); near-field scanning optical microscopes (NSOM); scanning tunneling optical microscopes (STOM); near-field scanning acoustical microscopes (NSAM); scanning capacitance microscopes (SCM); and scanning electrochemistry microscopes (SECM).
55. (New) The method of claim 24 wherein the forming a bond between the scanning probe microscope tip and another of the plurality of reactive nanoscale objects comprises moving the scanning probe microscope tip toward the plurality of reactive nanoscale objects to a proximity sufficient to cause the forming of the bond between the scanning probe microscope tip and another of the plurality of reactive nanoscale objects.
56. (New) The method of claim 24 wherein the forming of the bond between the reactive site target position and the another reactive nanoscale object bonded to the scanning probe microscope tip comprises moving the scanning probe microscope tip to bring the another reactive nanoscale object into proximity with the reactive site target position sufficient to cause the forming of the bond between the reactive site target position and the another reactive nanoscale object.
57. (New) The method of claim 24 wherein the passive surface lies in more than one plane.

PATENT

Attorney Docket No.: 34003.55/P034

Customer No.: 000027683

58. (New) The method of claim 24 wherein the plurality of reactive nanoscale objects comprise at least one of atoms, molecules, dendrimers, macro-molecules, viruses, phages, colloids, clusters, nanoparticles and nano-devices.

59. (New) The method of claim 27 wherein the moving of the scanning probe microscope tip with the at least one selected object bonded thereto to one of the surface target positions comprises:

moving the scanning probe microscope tip in an upward direction relative to the plane in which the passive surface lies;

moving the scanning probe microscope tip in a direction parallel to the plane in which the passive surface lies and toward the surface target position; and

moving the scanning probe microscope tip in a downward direction relative to the plane in which the surface target position lies.

60. (New) The method of claim 27 wherein the passive surface comprises a surface selected from a hydrogen-terminated semiconductor surface, an inherently passive surface and a natively passive surface.

61. (New) The method of claim 27 wherein the passive surface comprises a surface selected from a hydrogen-terminated silicon surface, a graphite surface and a mica surface.

62. (New) The method of claim 27 wherein the passive surface comprises an inherently passive surface and the acting of the scanning probe microscope tip on the passive surface to form one or more surface target positions comprises at least one of breaking bonds within the surface and locally oxidizing the surface.

63. (New) The method of claim 27 wherein the passive surface comprises a hydrogen-terminated semiconductor surface, and the acting of the scanning probe microscope tip on the passive surface comprises removing at least one hydrogen atom from the passive surface.

PATENT

Attorney Docket No.: 34003.55/P034

Customer No.: 000027683

64. (New) The method of claim 27 wherein the scanning probe microscope is selected from the group consisting of: scanning tunneling microscopes (STM); atomic force microscopes (AFM); near-field scanning optical microscopes (NSOM); scanning tunneling optical microscopes (STOM); near-field scanning acoustical microscopes (NSAM); scanning capacitance microscopes (SCM); and scanning electrochemistry microscopes (SECM).

65. (New) The method of claim 27 wherein the passive surface lies in more than one plane.

66. (New) The method of claim 27 wherein the plurality of reactive nanoscale objects comprise at least one atoms, molecules, dendrimers, macro-molecules, viruses, phages, colloids, clusters, nanoparticles and nano-devices.